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TITLE: SUSPENDED CONTAINERS

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SUSPENDED CONTAINERS

This invention relates to disposable packaging, to sales displays, to improved techniques for carrying products in containers, to pre-packaged products, to take out consumable products, and to methods of manufacturing packaging.

This invention, in some aspects, employs concepts described in our pending applications U.S. Application Serial Number 10/052,210, filed January 16, 2002, PCT Application Serial Number US02/01112, filed January 16, 2002, published as WO 02/057154 A1 and PCT Application Serial Number US03/14175, filed May 6, 2003, the entire contents of each of which is hereby incorporated by reference in its entirety. In other aspects, the invention represents further advantageous features in the design, construction, handling and methods of making overcaps, lids and rings and relating them to disposable containers and the like.

INTRODUCTION TO THE INVENTION

The invention is based on a container that is supported by a suspending element provided by an overcap, lid or supporting ring. It provides to manufacturers, stores, restaurants, take-out counters, and customers a new form of packaging, display and means of transport. In many preferred forms the suspending element is so associated with the overcap or lid that the container, when suspended, hangs by gravity at a substantial angle. In many preferred embodiments the container that is associated with the suspending element has flexible walls and a thickened rim. The container may be a molded plastic can, cup or tube having an edge bead; it may be a conventional disposable paper or foam container, a coffee cup or a cup for cereal or soup having a rim bead; it may be a can (tin) of goods having a metal or plastic top and an outwardly protruding edge bead. It may be a composite container having a wall of e.g. helical wound paper substance or of blown plastic, in either case combined with a metal rim, peripheral bead or end closure. In many preferred forms, the overcap, lid or support ring with which the suspending element is integrated has a clear central section enabling view of the contents, or view of a tamper-evident seal. Particular embodiments of the invention have many other important features and uses.

According to one aspect of the invention, an overcap or lid for a container, or a support ring associated with the container, has an elongated finger suspender. In important embodiments the finger suspender is of plastic resin that is molded or otherwise formed integrally with the rim of the overcap, lid or the support ring. Such integral formation includes the suspender being formed as a monolith with the rim as the rim is formed or being preformed and bonded to the rim in the rim-forming step, as by insert injection molding. Other techniques of joining are also contemplated.

According to another aspect of the invention, suspending elements of a series of containers are constructed and arranged for one to be interfit into the opening of another, to enable units to be strung together for transport or display.

According to another aspect of the invention, a suspending element is located so off-center that the container, when supported by the suspender element, hangs at a marked tilt angle. In preferred embodiments of this feature, the product is hung from an elevated location, e.g. in unused high space in a retail store, and the tilt angle so situates the side of the container that it faces the customer due to the tilt of the container. The side of the container is readily noticed and identified by its printing. In another instance, the product is suspended below eye level, e.g. near the floor, and the tilt angle tilts the top of the container toward the customer for notice and ready reading of its brand and contents. In preferred embodiments, similar containers are suspended together, some tilted in one direction, others in another, such that they efficiently utilize presentation space, and their advertising is positioned to be read from various angles. In this way the containers may advantageously occupy space heretofore devoted only to products in flexible packaging such as cello or bubble wrapped products.

Another feature of the invention is a finger suspender which involves two finger-engageable openings in series along the suspender element, selectable for use in accordance with the user's preference. This embodiment takes account of the user's other needs for her or his hand, and the size of the container or string of containers being supported. In one embodiment of this aspect, a finger-engageable opening of the suspender is positioned to facilitate application of force to break a seal or bend back a portion of the lid or ring to facilitate its disengagement from the container. Another

feature of the invention is the near-lying finger engageable opening per se, constructed to function as a finger suspender of an overcap lid or ring.

Another embodiment of the invention has two opposed finger suspender elements, each formed integrally with an overcap, lid or support ring arranged so that both suspender elements can be grasped by one or more fingers to lift the container. In preferred embodiments, the suspender elements lie in a single plane in nested fashion, extending from hinge roots at opposite sides of the rim of the overcap, lid or support ring.

The container filled with merchandise may be suspended in singles or multiples from a display rack. After purchase, the container may be supported by its suspender element by a finger leaving the hand free for additional activities, such as carrying a cup of hot coffee, a cold drink, a bag of popcorn, a plate of food, a briefcase, a tennis racket, a paint brush or a bag of groceries or leaving the hand still free for holding the hand of a child, parent or friend.

The container may be inexpensively constructed in accordance with this invention while providing for a variety of ornamental and distinctive appearances and trade dresses by surfaces that carry decoration and printing. The walls of the container can be printed to serve as holiday decoration or as a gift presentation. The shape of the container and its lid, their aspect ratios, configurations and colors may all be varied while remaining within the scope of the present invention.

A replaceable overcap, lid or support ring associated with a suspending element according to the invention may be removed from the container for partial consumption of the contents while remaining intact, available to be reattached to transport the left-over contents. In the home, the suspended containers may be placed in ordinarily unusable space, e.g. in waste space of a cabinet or a refrigerator. Suitable merchandise in the container includes pre-packaged chips, dried soups, cereals, spices, grains, legumes, dried fruits, cookies, crackers, coffee in bean or ground form, nuts, snacks, popcorn, candy, yogurt, ice cream, butter, frozen juice concentrate, cheese dips and condiments, and indeed all of the variety of goods ordinarily presented in cans or tins, including weighty food items, as well as hardware supplies, tennis balls, etc.

Certain embodiments include delicate products ranging from wrapped chocolate truffles to sets of small electric light bulbs. Preferably, with insulation features, a finger

suspendable container may contain hot or cold contents such as hot soup, hot coffee, cold drinks, hot ready-to-eat foods, ice cream or yogurt, in single servings or larger quantities.

In many cases the invention includes tamper-evident features and vision access to the goods within the container, while in other cases retail establishments or their customers fill containers on-site.

Containers according to the invention can be efficiently displayed on single and multi-tier counter racks, tree displays or on horizontal or vertical lines of hooks. In some cases, in effect, the novel suspender containers can add another display row to a space-limited store, counter or kiosk. In many cases, embodiments of the invention enable presentation of cans, tubes and cup-form containers in places where they previously have not been considered suitable, e.g. suspended from display hooks, pegs, clips, display strips and in vending machines that were not intended for cups or cans.

According to a particular aspect of the invention, a disposable container with consumable contents is combined with a flexible finger suspender as described, the container being of greater than about 5 cm (2 inches) minimum horizontal dimension at its mouth, the container mouth engaged by a removable overcap, lid or support ring, the container having an upstanding wall of generally flexible material extending from a bottom to a wide mouth top, the container mouth being about as wide as the horizontal cross-section of the container, the wide mouth defined by a relatively thick rim formation, and the overcap, lid or support ring having a rim portion extending over and removably engaged with the rim formation of the container. The overcap, lid or support ring attached as by snap fit, are constructed to support the container and its contents, the flexible finger suspender being comprised of the material of the rim portion and being formed integrally with it, whereby the finger suspender enables the wide mouth container to be suspended for display and transport by the finger of a hand. In other cases, the finger suspender is pre-formed and joined to the overcap, lid or ring during forming of the latter. In such cases, the finger suspender may be of different material, form tht of the main body of the closure.

Preferred embodiments of this aspect of the invention have one or more of the following features:

The finger suspender as formed, extends flat across the top of the container and is deflectable to an upright position about a flexible attachment root portion. Preferably, in many cases, the flexible root portion of the suspender is located in the rim region of the removable lid or supporting ring. In many cases the finger suspender has a length exceeding the radius or one half the lateral dimension of the rim of the container, in many preferred embodiments its length being about three fourths of that dimension or more.

The overcap, lid or support ring includes a rim of resilient plastic resin and the suspending element may be an integral extension from the rim, of the same resin, in a monolithic construction. In certain cases, preferably, the suspending element, as manufactured, lies, substantially in a plane coincident with or parallel to a plane of the rim, preferably within the confining planes of the rim. The suspender may reside in un-stressed condition or be detained in a pre-stressed condition from which it can pop-up when released from detents or other means that retain it.

In important cases, the suspending element lies inwardly of the rim portion of the overcap, lid or support ring; for example, the suspending element extends inwardly as a flexible or deflectable integral projection from the rim to a free end which defines an opening sized to receive the finger, i.e. it forms a finger suspender. In other cases the suspending element lies outwardly of the rim, as a deflectable integral outward projection from the rim to a free end, which defines an opening sized to receive the finger, here again being a finger suspender. In still other cases, other suspending structures are employed, e.g. of bail form. In preferred cases, in important embodiments, the suspending element is in off-centered relationship to the overcap, lid or support ring so that the container hangs at a substantial angle. It is found that pairing of angled containers hanging in opposite directions can improve the utilization of hanging space in many instances, and as well, augment the visual effect.

According to another aspect of the invention, a combination is provided including a disposable container for consumable contents and a suspending element, the container being of greater than about 5 cm (2 inches) minimum horizontal dimension at its mouth, which is closed at least in part by a removable overcap or lid or is engaged by a support ring, the container having a wall of upstanding, generally flexible material extending from a bottom to a wide mouth at the top, the mouth being about as wide as the

horizontal cross-section of the container, the wide mouth defined by a relatively thick or rigid rim formation, and the lid or suspension ring having a rim portion extending over and removably engaged in load-transmitting relation with the rim formation of the container, a single suspending element extending from and being formed integrally with the rim region of the overcap, lid or support ring, the suspending element being located to suspend the container at a tilted orientation.

In many implementations the container is of conventional molded plastic resin or resinous foam with integral sidewalls and bottom, or of paper stock such as drinking cup paper stock, for instance, coffee cup paper stock, or is of helically wound paper stock or of molded paper pulp, or is a blown or drawn or vacuum-formed plastic container. In such instances, the rim formation of the container advantageously comprises an outwardly protruding bead or a bead.

It is advantageous in many implementations that the plastic overcap, lid or support ring be snap-fit over a bead or other rim formation of the container in a joint sufficiently strong to support the container's weight. In other cases there is a folded rim associated with the container, as in the case of certain ice cream containers designed for friction fit of the lid telescoped over the container top.

In certain cases, the flexible wall of the container comprises plastic foam, and the rim formation of the container has a thickness of foam greater than lower portions of the container walls.

In many cases, the attachment of the lid to the container includes an outer heat-shrunk plastic film band that forms a tamper-evident exterior seal. Preferably, the seal surrounds mating rim portions of the body of the container, adding to the strength and stability to the connection of the overcap, lid or support ring with the container.

Preferred embodiments of various aspects of the invention feature a finger-suspender or otherwise suspended overcap, lid or support ring, which has an open or clear section in its center through which the goods or a tamper-evident seal may be viewed. In certain embodiments, the overcap or lid comprises a colored or opaque outer rim and a central region of clear plastic. In other embodiments, it has a rim region and a central region integrally formed of clear plastic and a second colored or opaque rim member is attached to the clear plastic rim to render the composite rim region colored or opaque.

In certain implementations, the rim member of the overcap, lid or the support ring has a depending skirt that is heat-shrunk about the rim region of the container to form an exterior seal.

In other implementations, there is a clear plastic film member and an annular rim member, the clear plastic film member extending across the central portion of the lid to define a viewing window, and having a skirt that depends past, and is heat-sealed in the region of, an upper rim formation of the container.

Various embodiments of the invention are advantageously combined with a display rack or device on which the container can be suspended by its suspending element. The display rack or device defines a support, such as a rod, hook or clip on which multiple units of the container are displayed, hanging at angles, e.g. at an elevated position above the head of the consumer, or at a low position, e.g. near the floor, or at positions, e.g. at eye level, in which bags and flexible packaging have been previously thought more suitable than rigid or semi-rigid containers.

This invention, including the many detailed features that will be described, has many uses, and despite its simplicity, has not previously been known.

BRIEF DESCRIPTION OF THE DRAWINGS

Fig. 1 is a cut away perspective view of an embodiment of the invention, while Figs. 1a though 1d are, respectively, views of the supporting ring of Fig. 1 in plan, vertical cross-section, perspective as manufactured, and perspective in operable position.

Fig. 2 is a perspective view of an embodiment of the invention suspended by a finger of a hand that also holds a cup.

Fig. 3 is a perspective view of a tennis player transporting her or his racket by a hand, a finger of which suspends two cans of tennis balls according to the invention.

Fig. 4 is a perspective view of a string of three containers similar to that of Fig. 1, the finger suspenders of the containers having been intertwined, while Fig. 4a depicts the intertwining action.

Fig. 5 is a perspective view of products suspended at an angle, some products suspended on racks located above the head and other products suspended at lower than eye level.

Fig. 6 depicts a completed product while Figs. 6a, 6b and 6c are sequential views showing the assembly of the product of Fig. 6. Fig. 6d is a vertical cross-section of the container of Fig. 6.

Fig. 7 is a vertical cross-sectional view of a further embodiment having a sealing feature, in the form of a resilient overcap. Fig. 7a is a cross-sectional view of a similar embodiment shown in the mold in which it is formed, and Fig. 7b is a top view of the overcap of Fig. 7a with its finger suspender lying in the plane of original formation, within the bounding planes I and II of the overcap rim.

Figs. 8 and 8a are views similar to Fig. 7a of other overcap embodiments while Figs. 8 b and 8c show the mold of Fig. 8a at different stages in the steps of manufacturing the overcap of Fig. 8a. Fig. 8d is a vertical cross-section of the overcap of Fig. 8a, taken transversely to the axis of the elongated finger suspender of the overcap, with the suspender in pre-stressed but locked down position as the result of the final forming steps. Fig. 8e is a magnification of a portion of Fig. 8d, and Fig. 8f is a top view of the finished overcap of Fig. 8d.

Figs. 9, 9a, 10 and 11 are vertical cross-sectional views of further embodiments having sealing features.

Fig. 12 shows a finger-suspended rectangular container, Fig. 12a is a dismantled view of the container, Fig.12b shows the assembled container while Fig. 12c shows a series of the containers hanging from their finger suspenders for display.

Fig. 13 shows a double ringed finger suspender, while Figs. 13a and 13b illustrate use of the shorter finger opening in a lid-bending action.

Fig. 14 illustrates a lid having an integral finger suspender formed by a free-ended integral inward projection from the rim of a snap-on lid.

Fig. 15 is a broken away exploded view and Fig. 15a is a suspended view of a container having a twist lock lid.

Fig. 16 illustrates a lid having an integral finger suspender element formed by a free-ended outward integral projection from the rim of a snap-on lid.

Fig. 17 is a plan view of a novel two-suspending element construction, Fig. 17a illustrates the construction of Fig. 17 for a light load, that leaves the hand free for another function while Fig. 17b illustrates use of the construction for transport of a heavy can.

Fig. 18 is a cross-sectional view of a suspender unit-forming mold of clamshell type, for forming a suspender ring and sealing surface simultaneously while Fig. 19a is a side cross-section of the unit as it comes from the mold, Fig. 19b shows the unit with the deflectable suspender at the plane of the ring and Fig. 19c shows the deflectable suspender in its use position.

Figs. 20 and 20a are diagrammatic views of a molding system during stages of molding a suspender insert, while Fig. 20b is a diagrammatic side view of a suspender element and a sealing layer molded as a unit, and Fig. 20c illustrates the parts of the unit of Fig. 20b joined together. Fig. 20d is a top view of a suspender insert formed in the manner of Figs. 20-20c.

Fig. 21 is a diagrammatic side view of an injection molding station to which a suspender insert of various types illustrated can be introduced, and about which an attachment ring is molded by insert injection molding.

Fig. 21a is a view on an enlarged scale of a preferred embodiment of Fig. 21 in which the inserts being introduced to the mold are of two-layer construction comprising a top layer defining a deflectable suspender and below it a sealing layer.

Figs. 22-22i are perspective views of suspender inserts suitable for insert injection molding of attachment rings to form suspender units.

Figs. 23 and 23a illustrate two stages in the forming of an off-center bail suspender using clamshell type molding techniques.

Fig. 24 is a cross section of a plastic molded annular ring of a lid, having an inwardly extending flange, and a circular chipboard insert having its outer margin adhered to the underside of the flange of the ring, the insert having a folded, free-ended finger suspender of chipboard lying within the bounding planes of the lid.

Fig. 24a is a top view of the lid of Fig. 24; Fig. 24b is a perspective view showing the finger suspender in distended position; while Fig. 24c shows the chipboard cutout insert prior to the finger suspender being folded to the position shown in Fig. 24.

Fig. 25 shows a molded plastic snap ring of annular form, with inwardly extending flange, to the underside of which a die cut disc is adhesively applied, the disc including a circular chip board piece having a die-cut semi-circular fold-up handle, and, on the underside of the whole chip board cut out, a sealing film laminated about its

circular margin to the chipboard (not to the handle); Fig. 25a is a top view of the lid of Fig. 25 and Fig. 25b is a perspective view of the lid of Fig. 25, with the handle folded into position for use, while the seal remains in tact.

Fig. 26 is a vertical cross-sectional view of a lid having a semi-circular handle 12 molded of the same resin as, and simultaneously with, the surrounding snap ring, being joined thereto by diametrically opposite hinge regions, while Fig. 26a is a top view of the lid of Fig. 26, and Fig. 26b is a perspective view showing the handle flexed to suspending position. To the underside of an inwardly extending flange of the ring is adhered a sealing insert which may be a sealing film, a sealing chipboard printed insert or a combination thereof.

Fig. 27 is a view, similar to Fig. 26, of another molded rim and handle arrangement, in this case two arcuate handles extending inwardly to the center from root joining sections 20 that are offset from an axis of symmetry adjacent the most inward protrusion of the two handles. Fig. 27a is top view of the lid of Fig. 27 and Fig. 27b is a perspective showing the handles in their distended position. A sealing insert similar to that of Fig. 27 is shown in place.

Fig. 28 is a vertical cross section of a molded snap ring lid having a continuous molded closing surface extending across the top. To the upper surface of the top is adhered a chipboard die cut piece having two free-ended finger suspenders in inward, flat folded condition, lying within the upper and lower bounding planes of the lid. Fig. 28a shows in plan view the chipboard piece before the suspenders have been folded to the position shown in Fig. 28. When desired, these suspenders are folded upwardly along the dotted paths suggested in Fig. 28.

Fig. 29 is a vertical cross-section and Fig. 29a is a plan view of a molded plastic lid as shown in Fig. 28, to the top surface of which is adhered a circular chipboard member defining a handle, joined at diametrically opposite hinge regions. All but the underside of the handle has the adhesive, as suggested in Fig. 29b. In Fig. 29c a perspective shows the handle in extended position.

Figs. 30-30a show a monolithic overcap having an integral, inwardly extending off-center bail, extending parallel to the sealing surface, in form similar to that of Fig. 22h, Fig. 30 being a plan view, Fig. 30a a cross-sectional view of the rim taken at line

30a-30a of Fig. 30, Fig. 30b a perspective view showing folding upright of the asymmetric bail and Fig. 30c a perspective view showing paired, tilted hanging of two containers supported by off-center bails.

Figs. 31, 31' and 31a are top, partial vertical cross-section and perspective views of an overcap having an outside, centrally molded bail, while Figs. 31b and 31c are top and perspective views of an outside, asymmetrically molded bail.

Fig. 32 is a plan view and Figs. 32a and 32b are perspective views of use of a first version of an overcap having undersurface perforations defining a finger suspender, while Fig. 32c is a plan view and Figs. 32d and 32e are views similar to Figs. 32a and 32b, respectively, of use of the overcap of Fig. 32a.

Figs. 32f and 32g are cross-sectional views of alternative ways of forming the overcaps of Figs. 32 and 32a.

DESCRIPTION OF PREFERRED EMBODIMENTS

In Figs. 1-1d are shown a suspending ring constructed to be snap-fit over a container 2 that has an outwardly extending bead 8 at its wide mouth, as in the manner of a conventional resilient overcap, molded of synthetic thermoplastic resin.

The suspending ring SR comprises rim 4 of the injection molded plastic resin having a circular downwardly extending formation adapted to snap over and engage the circular bead 8 of the container 2 in the usual manner of snap-over lids as used with disposable drinking cups, plastic containers, and cans or tins.

Integrally molded with the rim 4 is finger suspender FS, comprising an inward projection of the plastic resin having an over-all length l, greater than the radius of the mouth of the container 2'. As shown it has a length l greater than 75% of the diameter of the mouth, and an overall length in excess of two inches. The over-all length l of suspender FS is comprised of a short root region R, a long leg portion L and a finger ring portion F. The finger suspender FS is flexible, in this embodiment being of sheet form of constant thickness. The short root region R is constructed to act as the principal load-bearing hinge. This hinge together with the extended length of the flexible suspender enables the suspender to be deflected, as shown, from a planar as-molded position, in

which it lies parallel to and within the bounding planes P and P_1 of the molded rim of the support ring, to an upright position when under load as shown in Figs. 1a and 1d.

The hinge location in the vicinity of the rim and the general flexibility of the suspender enables the container to rotate significantly due to significant off-set O_S of the center of mass of the container from the center of lift of the suspender FS. Accordingly, the container tilts to the angle É, (degree of cant) with highly desirable consequences, explained below.

The tilt angle α may be selected by suitable selection of the width, thickness and length of elongated suspender SF and the physical properties of the chosen plastic resin, in relation to the size and weight of the filled container and the degree of tilt angle É desired. Polyethylene, polypropylene, polystyrene, and in general, thermoplastic resins having a degree of resilience, such as conventionally used to injection mold snap lids, are suitable materials.

The finger ring opening F has an inner diameter d_i that exceeds the design dimension d_f of a user's finger, enabling the container to be suspended by the finger as shown in Fig. 1.

The base of the finger ring opening F terminates in slot S, which contributes to defining an overall opening of length d_s that is equal to or greater than the outer diameter d_o of the head of the finger suspender. The purpose of this feature is described later in connection with Figs. 4 and 4a.

Important advantages of the container associated with finger suspender FS of the support ring are illustrated in Fig. 2. Only one finger is used to support a full container of cereal as the user moves from a counter with a hot cup of coffee in the same hand. The relative location of the suspended container of cereal may be selected by the user, by selecting the tilt orientation of the container relative to the finger when initially lifting the container. This enables the container to be carried in the protected position, shown.

Support rings similarly applied to tennis ball cans 2", the rims of which are snapped over the metal outer ring of the can's conventional metal sealing lid, enables two cans of balls to be carried by a finger of the same hand that carries a tennis racket, Fig. 3.

In Fig. 3, the finger supports the rings of the suspenders of both cans. Alternatively, with suitable length, the suspenders of the cans may be intertwined so that only one finger ring needs to be lifted, using the feature now to be described.

Referring to Fig. 4, the head of one finger suspender FS_1 attached to its container, is turned to register with slot S in the head of the suspender FS_2 mounted on the other container. By grasping the head of the first suspender, FS_1, pulling it through and engaging a finger in its ring, both tennis cans can be supported.

Indeed, as suggested in Fig. 4a, with the flexible suspenders of suitable length relative to the diameter of the containers, an intertwined string of three or more containers may be formed and supported by a single finger.

Note in Fig. 4a, how the tilt angle assumed by each container is made use of in enabling the suspended containers to nest compactly for convenience in transport.

Referring to Fig. 5, the tilt angle É achieved by the present invention has important commercial display advantages. One needs to keep in mind that display space of a retail store, for instance, determines the variety and quantity of goods that may be presented. The tilt angle achievable by the off-center suspension described has an important advantage in allowing goods to be presented from high places at an angle that enables side labels to be readily noticed and read. Likewise, goods supported lower than eye level can be tilted by the act of suspension so that the label on the container lid may be readily read and the brand recognized. Similarly, by use of the finger suspenders, cups and tubes may be suspended for head-on viewing, most available for pickup, in space heretofore occupied mostly by flexibly wrapped products. Thus, the invention represents a contribution to point of purchase displays as well as to the convenience of transport, and enables more prevalent use of relatively rigid or semi rigid containers, tubes or cups, which contribute added to convenience to the user over flexibly packaged goods.

We note here that off-center loading of a somewhat elastic snap lid or the like may have appeared to others to be undesirable out of concern that the snap ring would be deformed and likely detach from the container. According to the invention it is found that a wide range of useful weight bearing is achievable before failure, by the features shown and by selection of the parameters of the substance and configuration of the resilient snap ring as well as the properties of the suspender discussed above. Weight

bearing with a significant safety factor has been found to be readily achievable. With little expense, the strength of the integral finger suspender can be great enough to exceed the disengagement force by a factor of 2, 3 or more, as desired. Thus, the weight of the product can be carried and the suspender can also be used to apply a greater force to remove the rim from the container.

The embodiments of Figs. 1-1d, 6-6d, 14, 15 and 16 may employ a conventional 8-ounce disposable paper beverage cup 2 having a rolled upper bead 8 and a snap suspending ring 4 or snap lid 4' based upon features of a conventional disposable thermoformed snap lid. Such a cup tapers, having, for instance, a minimum diameter of about 4.5 cm (1.75 inches) at its bottom and a maximum diameter of about 6.5 cm (2.5 inches) at its top, the mouth of the cup corresponding to the latter dimension. The ring or lid is of suitable plastic resin, e.g. of 0.5 mm thickness and the cup and rim or lid are cooperatively constructed to be snap-fit together, the rim portion of the ring or lid lying over and engaging outer bead 8 of the container. Likewise, the embodiments may employ a helically wound paper or chipboard container or a blown or drawn plastic tube.

The containers of Figs. 1-1d, 6-6d 14, 15 and 16 may be sealed by a segment of cellophane sheet, clear polyester film or the like, that is adhered to the rim 8 of the container described later in relation to Figs. 6-6d.

The lids shown in Figs. 14 and 16 correspond to lids designed for hot beverage, formed of opaque, colored plastic. However, unlike conventional snap lids for beverage cups, the lid 4 of Fig. 16 has a round central opening terminating at edge 11, of diameter, e.g., of 4.25 cm. Inserted into the rim of the lid of Figs. 14 and 16 and bonded in place to the undersurface of annular ridge 10 is a circular disk 7 of clear plastic resin, of diameter slightly smaller than the diameter of ridge 10, e.g. of 6 cm diameter. In each case, the clear sealing sheet segment provides a see-through window in the snap-lid.

As shown in Fig.6a, the paper wall of a cup terminates in a relatively rigid upper bead 8, which defines the circular top rim of the cup. In the embodiments of Figs. 14 and 16 the raised ridge 10 of the lid lies about 1 cm above the plane of the rim of the cup when the two are snapped together. The cup wall 3 is originally manufactured as flat paper stock and is printed with high accuracy in its flat form, to provide decoration, trade dress, notice of ingredients, etc. It is then cut, formed and glued in the usual way for

beverage cups, into the truncated conical shape shown. In the usual way, the bottom of the cup is formed of a separate bottom member 5, to which an in-turned margin of the lower part of the side wall 3 is bonded. As is common with beverage cup lids, a series of spaced-apart inward indentations, not shown, are provided in the lower rim of thermoformed lid 4, located to snap over the cup's rim bead 8 to resiliently engage the lower portion of bead 8 to secure the lid to the cup.

One preferred product is the container of Figs. 1, 6, 14, 15 or 16 pre-filled with delicate twist-wrapped chocolate mini-truffles 18 (chocolate shells with flavored soft gnoche centers). These are individually wrapped with metallized polyester wrapping film. As shown in Fig. 6, the free ends of the twisted truffle wrap, while flexible, have a degree of stiffness sufficient to cushion the truffles with each other and the inside walls of the container. As shown best in Fig. 6a and 6b, inner layer 19 of clear plastic is adhered across the rim of the cup, providing an air seal and a tamper-evident feature.

In certain preferred embodiments, an outer seal band 21, shown in Figs. 6b and 11, is applied across the juncture of the lid or suspending ring and the cup. It serves both to add security and provide a tamper-evident feature. Seal member 21 is an annular preform of heat-shrinkable resin such as polyethylene or acetate, sized to encompass the joint region of the container. After the container is filled, heat is applied to the seal preform 21, causing it to shrink to tightly engage both the rim 4 of the lid, or ring and the wall of the cup 3 below its bead 8. As suggested by the dotted lines in. Fig. 6, a tear feature 25 is incorporated in the preform 21 and visibly identified. To gain access to the container, the user first breaks this seal and then lifts off the lid of the container. The tear feature may be of many known kinds, e.g., a vertical row of perforations, with or without a pull tab or pull string.

Referring to Figs. 6a through 6c, the sequence of manufacture of a prepackaged product is illustrated. Cup 2 is gravity-filled with the desired contents, in the example twist-wrapped chocolate mini-truffles, Fig. 6a. The filled container then has a moisture barrier adhesively applied to its outer rim of clear plastic sheet 17, which passes relatively over the cup to provide the tamper-evident film segment 19. To accommodate projection into that space of a circular ridge of the lid or rim when the lid is snap-fit onto

the cup, the film may be formed with a downward indentation at the rim of the cup, or be yieldable in that region.

Fig. 6c shows the rim 4 of a suspending ring being applied to the filled and sealed cup which, for many products, completes the packaging. However, for the chocolate truffle product of Fig. 6, the seal preform 21 is positioned and exposed to heat H, as from a suitably shaped hot air appliance, which heat-shrinks the film band 21 to the conformation shown in Fig. 6. The band reinforces the interconnection between the rim 4 and cup 2. Such a seal can assure that a container and its contents can be suspended by the finger suspender during handling, even if the contents are heavy.

In certain embodiments, as where the contents of the container are of lightweight, the outer seal 21 may be omitted, while in other embodiments, as where protection of the goods does not require, the internal seal sheet 19 may be omitted.

The user gains access to the contents by rupturing the external seal 21, if present, and by grasping and pulling on the novel finger suspender with a force level considerably exceeding the weight of the package. The off-center relationship of the suspender to the rim 4 applies bending forces to the ring or lid, as the user firmly grasps and holds the cup steady. This action commences progressive disengagement from the rim bead 8 of the cup; indeed, in the case of a lid forming a hermetic seal, the lid may come off with the sound of a "pop." The user then removes the inner sealing film 19, if present, to gain access to the contents.

In certain preferred embodiments, the tear feature 25 is located on the periphery in alignment with the root hinge of the finger suspender FS. The two are thus cooperatively related, to enable a firm tug on the suspender to break outer seal 21 at its tear or break feature and remove the lid in one motion.

Selectable cost-effective features are combined with the suspender system to achieve the desired degree of sealing for freshness and security while permitting visibility of the product, or protection of the product from light or moisture, as desired.

Figure 6d illustrates that the clear film 19 or, in its place, foil or other opaque cover, can readily be sealed to the mouth of the container before application of the suspending rim by snap-fit over the container bead.

In the embodiment of Fig. 7, a single-piece molded snap lid offers complete closure. The finger suspender FS is molded integrally with the rim at an upper level, while a separated mold cavity parallel with the suspender cavity but spaced below, extends continuously from one side of the rim to the other, to form closure membrane C.

In the embodiments of Figs. 7a and 7b the finger suspender FS, which is a flexible sheet-form member as shown, is molded by use of a movable core element 34. In molding position, as shown in Fig. 7a, the core element 34 enables forming the planar central, liquid tight cover C integrally with the rim 4, independently of the spaced above, flexible finger suspender FS. The suspender, joined at its root to the molded rim of the overcap, lies just below the parting plane between upper and lower mold halves, 30 and 32. It is between the bounding planes I and II of the rim. The cover C lies lower, spaced from the finger suspender by the thickness of the core element 34. After the mold is filled and the piece solidifies, core element 34 is withdrawn laterally in the direction of the arrow, parallel to its plane of extent. When the core is fully retracted, the molded piece is ejected from the lower half of the mold.

As shown in Fig. 7b, the finger suspender FS lies in a central channel formed in the cover, in protected position for automated handling of the overcap. It can be retained in that position by small frangible runners. As can be understood from Fig. 7a, in the finished part, there is space, between the outer end of the finger suspender FS and molded cover C, in which one can insert a fingernail or finger to simply pry the suspender into a suspending position shown in Fig. 7.

The embodiments of Figs. 8 and 8a differ from the embodiments of Fig. 7 and 7a in that, as initially molded, the finger suspender FS is not confined between the bounding planes I and II of the rim 4, in Fig. 8 the suspender extending at an acute angle, in Fig. 8a, the suspender beginning at such angle, then bending back to parallel with the rim but spaced from it. However, during further steps in its formation, after raising of mold half 34, 42, respectively, and withdrawal of the core element 36, 46, respectively, a wedge-form displacement member, 40, 40a, respectively, moves laterally over the top of the lower mold half in the direction of the arrows. By a wedging action it displaces the finger suspender downwardly to its final formed position. Either by virtue of a permanent "ironing" effect of the displacement member acting upon the still-warm

molded resin, or by virtue of retention detents such as to be described, the final, as-manufactured position of the finger suspender FS is between the confining planes I and II as defined in respect of Fig. 7a. As a result, the embodiments of Figs. 8 and 8a, too, are suitable for automatic or robotized handling of the overcaps, without concern that the suspenders will impede the action of cap feeders and other movements. Figs. 8b and 8c depict successive positions of the displacement member 40a during its action on the finger suspender FS. As seen from Figs. 8d and 8f, and more clearly in the magnified partial view of Fig. 8e, molded side projections 52 slightly protrude from the lateral sides of the finger suspender FS at its widest dimension at the finger hole F. By the wedging action of the displacement member 40a, these are forced downward to move past ledges 50 formed in the side walls of the channel into which the finger suspender has been pressed. Ledges 50 act as detents to hold the finger suspender in its depressed position between bounding planes I and II, overcoming any slight self-lifting tendency that may remain due to the original orientation of molding of the finger suspender. This lifting tendency can be taken advantage of in assisting the finger suspender in rising to useful position after being dislodged by a gentle upward force applied to the tip of the suspender by a finger, finger nail or simple prying device.

In the embodiments of Figs. 7b, 8 and 8a, opposed stacking ring segments 48 are provided, covering most of a full circle, but interrupted at diametrically opposed positions to provide space to enable the lateral motion of the core element and the displacement member. The ring segments 48 are sufficient in extent to ensure reliable stacking of the overcaps in the usual way.

In the embodiment of Fig. 9 a separate closure element C_1 is preformed, inserted into the suspending rim and joined, as by adhesive, to the underside of the rim. As shown, element C_1 is of diameter larger than the diameter of the container such the rim when snapped over the mouth of the container compresses the closure material C_1 between the suspension rim and the rim of the container to form a seal.

In the embodiment of Fig. 9a, an inwardly protruding supporting flange formation F is molded on the inside of the skirt of the suspending ring, thus defining a peripheral slot into which a preformed closure disc may be snapped and held secure. Again, the

dimensions may be selected to cause the closure material C_2 to be compressed when the ring is snapped over the container bead 8.

In the embodiment of Fig. 10, a snap-fit closure 4a of otherwise conventional form defines its own peripheral outer bead B. A suspending ring 4", which may otherwise be of the construction previously described, has a snap groove sized and arranged to snap-fit over bead B, so that desired closure and suspending functions are achieved by two parts that are snap-fit together. Two station automatic machinery can first snap the closure 4a on the container and then snap the suspending ring 4" on the closure 4a. Alternatively, the ring and closure may be first automatically assembled and the assembly may then be snap-fit to the container.

In the embodiment of Fig. 11, the suspending ring extends over the mouth of the container with friction fit. Depending upon the load within the container and the radial compressive forces between ring and container determined by relative sizing and selection of materials, the engagement may be sufficient to transfer the weight to enable finger suspension for transport or display. For an added degree of security, a heat shrunk security ring 21 as previously described, may be applied.

In the embodiment of Figs. 12-12c, lid 10 and carton 11 are of square or rectangular profile, while having other features similar to those described. This particular embodiment provides for efficient use of hanging space. As illustrated in Fig. 12c, little open space remains between adjacent packages suspended on a rod.

In Fig. 13 is shown a finger suspender SF_1 having two finger openings F_1 and F_2 spaced along the length of the suspender. The outer opening F_2 is employed as previously described.

The inner finger opening F_1 may be used, in accordance with user preference, to more snugly suspend a container relative to a hand, and in some cases to brace it against the lower edge of the hand. The lower opening F_1 is useful in certain instances to aid in lifting a lid as by interaction with the thumb. As shown, force applied by a finger inserted in opening F_1 is used to bend back the portion of the elastic lid to which the suspender is attached while the thumb holds down the center of the lid. In certain instances, only the lower finger suspending opening is employed as in Figs. 13 or Figs. 13a and b, in which case the outer end of the suspender may be omitted.

Fig. 14 illustrates a preferred embodiment of a container having a lid 4' with a finger suspender FS formed integrally with lid top surface. The suspender FS extends from attached proximal end to a distal end. In its as-formed, relaxed state, it lies generally flat relative to planar top surface of the lid, thus allowing lid stacking and container stacking advantages. As with previous embodiments, lid 4' is provided with an internal film laminate attached along the undersurface of its rim to provide a seal between the container contents and the external environment. As before, the distal end of suspender SF has a hole for suspension of the container formed by the combination of the lid and cup as illustrated.

In an alternative embodiment, Figs. 15 and 15a illustrate a locking arrangement for selectively securing a lid to a cup or other container. The locking arrangement is explained in U.S. Patent 6,056,144, issued May 2, 2000, the entire contents of which are hereby incorporated by reference. Briefly, the lid 80 is equipped with locking formations 90 (only one shown) extending radially inward from lid flange 91. Cup 81 has recesses 92 (only one shown) formed along the bead 93 of its lid for allowing locking formation 90 to pass below bead 93 when lid 80, aligned with cup 81 as shown in Fig. 15, is pressed downwardly onto cup 81'.

Once locking formations 90 are below bead 93, lid 80 is rotated relative to cup 81 so that locking formations 90 are no longer aligned with recesses 92. Formations 90 then provide locking engagement with bead 93 to prevent removal of the lid from the cup. In this configuration, illustrated in Fig.15a, the container, even with relatively heavy contents, can be suspended by finger suspender FS without disengaging the lid from the cup.

Fig. 16 illustrates a preferred embodiment of a container having a lid 70 with an integrally formed finger suspender FS_2. The suspender FS_2 extends from attached proximal end 74 to a distal end 76. A hole 78 is provided in distal end 76 to act as a loop for suspension of the container formed by the combination of lid 70 and cup 71 as illustrated.

In its as-formed, relaxed state, suspender SF_2 extends downwardly from lid 70 parallel to lid flange 73. This arrangement allows lid 70 to be stacked with like lids during lid manufacturing, storing, and any necessary shipping. Furthermore, containers

having cups 71 and lids 70 filled with product, can be stacked for storage, shipping and handling without substantial interference from suspender SF_2 which lies, in its relaxed condition, parallel to the surface of the cup.

Referring to Fig. 17, for large objects a novel nested arrangement of a pair of finger suspenders FS_3, FS_4 is provided by an arrangement in which the center axis A of each elongated suspender is curved, and the centers of the two finger openings lie on a diameter d_1 of the circular top, with the hinge root region of each suspender being off-set from d_1 and of asymmetrical, spiral-like form. The roots of these suspenders are diametrically opposed along diameter d_2 which forms a substantial angle with diameter d_1.

Though upon applying load, the finger openings do not precisely align, still, by being suitably oversized, a common passage is defined by overlapped regions of the openings to admit one or more supporting fingers.

Lifting the two suspenders together causes the somewhat flexible rim of the snap ring to tend to pull into oval form, thus tightening symmetrical portions of the rim of the suspension ring against opposite sides of the container. This action effectively tightens the grip of the suspension ring on the container.

This ring and simple variations of it have the novel capability of conveniently handling large and heretofore unwieldy containers. The containers can be supported by a hand in a manner still enabling the hand to be free for other functions, as illustrated.

Applications of such a suspending rim, that snap fits over the conventional edge bead of a metal can or paper tub, range from carrying a heavy can of shortening or paint to conveniently handling of a tub of popcorn at the movies. Especially where maximum load-carrying capacity is not required, the root region of the suspenders may be narrowed and straightened, for increased flexibility.

Figs. 18 and 19a-c relate to forming a fully formed overcap, and Figs. 20 and 20a relate to forming an insert for insert injection molding of an overcap as a second step. In each embodiment, a forming sequence of molding and folding is illustrated. Referring first to Fig. 20, an injection mold 80 comprises upper and lower mold halves 82, 84 defining a "clamshell" mold cavity of two sections 86, 88 joined by hinge cavity section 83. Mold cavity 86 is of the form of a finger suspender having a finger opening F while

mold cavity 88 is of the form of sealing layer of an overcap. After injecting the resin, the molded part is withdrawn, Fig. 20a. Suspender half 86a is rotated until its finger opening F matches with and snap-fits with a corresponding formation F' of the exposed surface of the lower layer 88a. The root R of the suspender element, preferably in the bifurcated form shown in Fig. 20d, may be thermo-welded to the underlying supporting layer 13b. Thus a completed mold insert 12c' is formed, with the presence of hinge H. The hinge may be cut away or incorporated in the molded rim of the attachment ring in the next operation, insert injection molding. Such molding will be discussed later in conjunction with Figs. 21 and 22.

Fig. 20d is a top view of a mold insert unit formed by the clamshell injection molding technique. In this case, finger suspender 16a independent of a surrounding rim is formed in the left cavity 84 of the clamshell mold and the bifurcated hinge, extending between the two clamshell mold halves, is of form suitable to be folded over and lie upon a sealing layer formed by the second mold half, to form the hinge for the suspender. In this configuration the hinge is to be surrounded by injection molded resin of the connecting ring when the ring is formed about the insert, hence is not cut away. Similar techniques can be employed to form a completed suspender unit, as will now be described.

Referring to Fig. 18, a completed overcap unit with finger suspender is formed by clamshell techniques in the same way as the product of Figs. 20 and 20d except that the cavity 90' on the right side of the mold is shaped to form a complete snap lid 90, including both connecting ring 92 having formation 93 for engaging the rim of a container and a top sealing surface 94 for covering the container. The ring has a detent depression 97 facing upwardly, matched with detent 98 molded on the end of suspender 96.

After molding, the deflectable suspender 96 is folded over as suggested by the dotted lines of Fig. 19a to the position shown in Fig. 19b, in which detent 98 enters and is caught in depression 97. This retains the suspender 96 in its folded-down position.

When desired, e.g. after the overcap or lid has been snap-applied to a container, suspender 96 is pulled free of the detent. Due to memory of the plastic resin of which it

is molded, it self-lifts to an upwardly angled position such as shown in Fig. 19c, ready to be grasped and suspended by finger opening 11.

Referring to Fig. 21, an insert injection molding system for forming a snap ring of synthetic resin is shown. Mold 10 is operated between closed (solid line) and open dashed line) positions. During each mold cycle, a preformed suspender insert 12, shown diagrammatically in various selectable forms in Fig. 21, is automatically placed in the open mold, in a motion symbolically indicated by arrow A, using known insertion techniques. The mold is then closed, arrow B, suitable molten resin is injected into the mold by injection molding system 14, arrow C, the mold is opened to the dashed-line position and the molded article removed, arrow D. Removal can be caused conventionally, for instance by ejector pins (not shown), that enable the molded lid to be freed and fall from the mold by gravity, to be fed in conventional way to conventional overcap-stacking or handling equipment.

The preformed insert 12 preferably has one of a number of novel constructions depending upon the intended use for the suspender unit. It may have various peripheral forms depending upon the shape of the container with which the lid is desired to be used, for instance, round, oval, rectangular, square or triangular, each with or without rounded corners, etc. Some preferred inserts will now be described. For other examples, refer to PCT US03/14175, which has been incorporated in its entirety by reference.

Figs. 22-22i show preferred forms of suspender inserts, for use in insert injection molding of suspender units, or for serving as inserts to be integrated with preformed attachment rings as by snap-fit or adhesion. (Fully molded overcaps, i.e. with suspender monolithically molded with the central members of form similar to Figs. 22-22i, may likewise be formed by techniques previously described, and are intended to be also illustrated by this sequence of figures.)

The suspender unit of Fig. 21a formed with the insert assembly of Fig. 20d is an example of a completed unit formed by insert injection molding.

Each of the inserts of Figs. 22-22i is comprised of two concentric layers, 13a, 13b, the bottom layer 13b providing a seal surface for the container and the top layer 13a providing a deflectable suspender. These layers, if constructed to be self-supporting, may each be independently inserted into an injection mold in succession as two separate

pieces. In such cases, heat-activatable adhesive may be provided on one or both of the in-between surfaces which may be activated by the heat and pressure of the molding operation to bond them together if desired. In other advantageous instances, the elements are first formed and adhered together to form a single insert unit, as by the techniques described with respect to Figs. 7-10 or as described in PCT US03/14175, which is incorporated by reference.

In the embodiment of Fig. 22, the lower seal layer 13b is of larger diameter than the layer 13a which forms the deflectable suspender 16. Layer 13a defines the root R of cantilevered finger suspender 16 and an annular supporting rim 18. The suspender 16 is much smaller in transverse lateral extent than the rim 18 and is surrounded by open space. Between the rim 18 and the suspender 16 and through finger aperture 11, the material of lower layer 13b is visible to the consumer, and if of transparent material, provides visible access to the goods within the container, as well as to any printing on layer 13b.

Alternatively, an insert such as 13a of Fig. 22, by being sized of diameter smaller than the ring of a preformed closure lid, may be attached at root R and at rim 18 to the top central surface of a pre-formed lid, rim 18 being of assistance in enabling automatic feeding, for instance if the element 13a is an injection molded part. Injection molding may be preferred for providing user-friendly features such as smooth and enlarged finger-engaging surfaces at opening 11, or features corresponding to a desired aesthetic product design.

The embodiment of Fig. 22a differs from that of Fig. 22 in that the two layers are of the same diameter. The provision of optional retaining runners, strands, tabs, tack welds or adhesive spots for temporarily retaining the suspender at its original plane is suggested by dashed lines T. Such provisions may be employed in all of the embodiments of Figs. 22-22i.

The shortened suspenders of the mold inserts of Figs. 22b and 22c lying in the plane at the upper layer 13a are formed with finger holes 11, to serve as finger suspenders integrated with the overcap. In some instances the holes here, as well as in the other embodiments of overcaps, lids and rings may be made smaller and serve only as receivers for hanging rods or hooks for display purposes, or larger to provide greater visual access

through transparent sealing layers and the like. In the embodiment of Fig. 22b, root R is located centrally of the lid, to enable the container to be suspended in straight-up orientation (not tilted), as may be desirable for certain sales displays, or for finger suspension of goods or fluids that may tend to leak from a resealed container. In the embodiment of Fig. 22c, the root region R of shortened suspender 16b is located close to the periphery, to cause the container to be suspended at an angle for desirable display effects, or for convenience when the hand is also holding other objects. The inserts of Figs. 22 and 22c, as with all of the inserts of Figs. 22-22i, are of circular peripheral form, that can enable automatic feeding if the parts are injection molded, for instance.

The insert of Fig. 22d provides the finger suspender essentially as a cut-out, e.g. from paper stock as described in Figs. 2 and 5 of PCT US03/14175.

The inserts of Figs. 22e and 22f define bail-like suspenders 16c attached at diametrically opposite flexible hinge regions H. The embodiment of Fig. 22e with a large central cut-out gives wide visual access through layer 13b when transparent. In certain embodiments it is advantageous that hinge regions H, indeed the entire layer 13a, be of polypropylene or other material or construction of suitable strength and flexibility to form a living hinge of sufficient strength out of regard for the particular weight planned for the associated container and its contents. Flow conditions in the mold can be engineered in accordance with living hinge principles to achieve orientation of the polymer in the hinge region, where the characteristics of such orientation is desired.

The insert of Fig. 22g defined as a pair of finger suspenders 16e, 16f, is formed according to principles discussed above in relation to Figs. 17-17b. Clearance slots Ce and Cf enable the respective suspenders to flex about their respective roots Re, Rf.

It is to be noted that the embodiments of Figs. 22f and 22g employ thin clearance slots between the suspenders and adjacent material, making these designs, as well as those of Fig. 22d, suitable for including temporary retaining runners tabs or filaments T, e.g. as discussed above, for retaining the suspenders in the plane of their layers until desired to be lifted, and also, in molded embodiments, providing advantageous mold cavity-filling runners.

The insert of Fig. 22h is of bail-like form with separate roots R_1, R_2 at the two ends of the thin bail member 16d. Roots R_1 and R_2, however are spaced apart arcuately,

at angle α substantially less than 180°. Indeed in the preferred embodiment shown, angle α is less than 90°, in the range of 50 to 70°. Such offset location of the roots R_1, R_2 ensures that the container, supported by the bail, will hang at a desired acute angle to achieve the advantages of tilt that have been described. The bail provides an opening suitable for a finger, or indeed for the entire band of a child, depending upon scale.

Similar advantages are obtained with the insert of Fig. 22i. In this case angle α' between roots R_3 and R_4 is of the order of 90°, still an angle to ensure significant tilting of the suspended container. In this case roots R_3 and R_4, and the bail 16e lie at the outer periphery of a closed disk. The mold into which the insert is placed is constructed to form the joining ring concentrically, inwardly of the bail 16e, so that the bail lies outwardly of the rim of the resultant resilient overcap formed by the techniques of Figs. 21 and 21a.

In other advantageous instances, depending upon types of packaging materials selected, all of the forms shown in Figs. 22-22i may be manufactured of preformed sheet material, e.g. of plastic, chip board or coated paper stock, or may be comprised of injection molded or insert injection molded parts, e.g. using techniques described above.

In Figs. 23 and 23a is illustrated the forming of an off-centered insert employing clamshell molding techniques as generally described in relation to Figs. 18 and 20. The unit is first molded as shown in Fig. 23, then folded to the form of Fig. 23a.

The inserts have been shown round for convenience of illustration, and because many times round mouthed containers are preferred for use with the invention such as for round disposable snack food, cookie or chip containers, coffee cups or tennis ball cans. For instance in Fig. 21a each of the inserts has a circular peripheral rim portion and carries in its mid region a flexible suspender extending from roots near the periphery. In certain cases it is preferred that the deflectable suspender be in the form of an elongated finger suspender 16 of cantilever form having elongated leg 21 and enlarged distal head 23 defining an opening 11 sized to receive a finger. The deflectable portion extends at least half the dimension of the insert in length, in many advantageous cases being about 2 inches or more in length.

In the embodiment of Figs. 24-24c, a chipboard insert 104 is inserted into a preformed plastic ring to complete the lid. As shown in Fig. 24c, the insert in this case comprises a complete circular disc of the paperboard to form a sealing layer, and an outer extension defining a finger suspender 16, that originates in the plane of the disc. This suspender is folded inwardly about the fold line L indicated, and, thus folded; the insert is attached to the underside of the inwardly protruding flange 114a of the plastic ring, with adhesive not shown. As can be seen in the cross section of Fig. 24, the finger suspender extends from one side of the ring to a free end E near the other side. As shown in Fig. 24b, after the lid is snap fit to the container 24, this finger suspender 16 can then be deflected by a finger, as the finger suspends the container 24, as shown.

In the embodiment of Figs. 25-25b, chipboard is die cut to form a flexible handle 121 of half circular shape concentric with its outer rim. This insert again is inserted and adhered to the under surface of the inwardly extending flange 114a of the pre-molded snap ring 114. Sealing film is adhered to the underside of the chipboard, without bond to the handle, to create a seal. As shown in the perspective view of Fig. 25 b, the handle 121 can be deflected to suspend the lid and the container, not shown, to which the lid is removably attached.

The embodiment of Figs. 26-26b is of similar construction, except that the large space 161 circumscribed by the inner edge of the bail-like handle 121 and the opposing portion of the rim 18 of the insert, is left open, providing, a viewing area of large dimension, by which the sealing film 161' can be seen, and with the film transparent, the goods in the container can be seen. The handle 121 is deflectable about root region 118R by a finger to the suspending position of Fig. 26b, but, in the vernacular of this description, this is a bail handle, not a finger suspender.

The embodiment of Figs. 27-27b has two arcuate handles 121a, 121b, molded of plastic integrally with the snap ring 114', that meet at the center of the lid Axis A, the roots of attachment 120R of these arcuate plastic handles being off-set about 20 degrees to each side from the center diametrical axis A. As indicated by the arrows in Fig. 27, and the perspective view of Fig. 27b, these handles can be deflected to slightly raised and twisted upright positions to support the container. A sealing layer 161' inserted and adhered to the underside of the inwardly extending flange 114a of the attachment ring

provides the sealing layer, and if transparent, provides visual access through the large openings circumscribed by the handles and the rim of the snap ring, as shown.

The embodiment of Figs. 28 and 28a, is similar to the embodiment of Fig. 24 in having a solid central disc 104a of adhesive-backed chipboard, but in this case two diametrically opposed finger suspender extensions 162 and 162a protrude to opposite sides of the disc 104a, and are folded over in overlapping condition, about the indicated fold lines L, to the position shown in the cross section of Fig. 28, within the confines of the molded ring 114. The disc 104a in the embodiment shown is integrated face to face to the upper surface of a molded closure lid portion 112 extending across the snap ring 114. When unfolded in the directions of the arrows, this embodiment provides two suspenders, at opposite sides of the lid, each having an extent longer than half the diameter of the lid, each having a root region L near the ring, an elongated leg and an enlarged distal head that defines a finger opening.

The embodiment of Figs 29-29c, has a handle 121' similar to that of Fig. 25, formed by a suitably die-cut disc of chipboard that is integrated face to face with adhesive, heat and pressure as shown, to the top surface 112 of a preformed lid, the adhesive 140 being omitted in the region of the lift-up handle 121', so that the handle can move to the upright, suspending position shown in Fig. 29c.

For description of the asymmetrically mounted bail of the overcap of Figs. 30-30c, refer to the description of Fig. 22h. In the instance of the overcap of Fig. 30, it is molded as one piece. A retractable core as described in connection with Fig. 7a may be used for instance to enable forming a continuous top C, and above it the mold bail 16d.

A monolithic molded overcap of resilient resin having an asymmetrically located bail is shown in Figs. 31, 31' and 31a. The top C of the overcap is closed. As shown in Fig. 31a, a container tends to hang straight occupying a vertical volume corresponding to the container. In contrast, the asymmetrically mounted bail of Figs. 31b and 31c ensures tilt of the container. The bails of two containers may closely approach one another, and can result in better utilization of a hanging peg and more interesting presentation of the product.

The series of Figs. 32 illustrates constructions in which the outline of finger suspender overcaps are defined, but the outer surface of the top of the overcap is un-

interrupted. Such a design may be desirable where graphic print is to be placed on the top of the overcap without interruption by presence of the suspender, or in cases of handling the product by suction lifters that are particularly sensitive to air leakage that might occur at minor surface discontinuities provided by the finger suspender.

The two examples shown in Figs. 32f and 32g are produced by insert molding techniques, see the discussion related to Figs. 21 and 21a.

For the embodiment of Fig. 32 f, a chip board insert 100 has score lines 102 in its undersurface that define the outline and break-away capability of a finger suspender as has been described.

The undersurface of the suspender itself, as well as the material filling its finger hole, is covered with release varnish selected to prevent binding with contacting molten resin. The remainder of the undersurface is left plain, and capable of tenaciously bonding to injected molten resin. The areas of strong bond are indicated by the darkened line at the interface of the respective regions in the diagram. Upon injection of the molten resin, the attachment ring 4, sealing cover C and other typical features of a resilient overcap are molded of thermoplastic resin, about the insert, in the manner of insert injection molding previously described.

In use, as shown in Fig. 32a , pressing on the outline of the finger hole of the finger suspender is effective to deflect the top of the overcap such that the inner edge of the suspender hole breaks and can be gripped and raised. This action separates the suspender from the bounding portions of the insert that remain tightly bonded to the plastic cover C. The center filler of the finger hole can readily be dislodged, as noted in Fig. 32b.

In the case of the construction of Fig. 32g, a pull-up tab 140 is provided at the distal end of the finger suspender. It can be a permanently raised protuberance, or a protuberance that rises in response to depression of the suspender form, as by provision of a suitable rocker structure, not shown. In the case of use of such pull-up tabs, it is appropriate for the material surrounding the outline of the finger suspender and as well, the filler of the finger hole, to be bonded to the underlying layer, while the suspender and tab remain free of such bond. Raising the tab breaks free the finger suspender, ready for use, and separates it from the filler that is retained by its strong bond.

Numerous modifications and other embodiments will be apparent to those skilled in the art and are comprehended by the following claims.